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A Functional Form for the Hölder-Type Theorem for the Completely Asymmetric Stable Process

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Let $\{X(t)\colon 0 \leq t \leq 1\}$ be a completely asymmetric stable process with characteristic exponent $0 < \alpha < 1$. Define the following sets of functions

$$D_\alpha(h) = \{\{2B(\alpha)\}^{-(1-\alpha)/\alpha} h^{-1/\alpha} (2\log h^{-1})^{(1-\alpha)/\alpha} \cdot (X(s+(\cdot)h) - X(s))\colon 0 \leq s \leq 1-h,\ h > 0\}$$

and

$$K_\alpha = \Big\{x\colon x \text{ non-decreasing on } [0,1],\ X(0) = 0,\ x \text{ strictly increasing on } J_x = \{t\colon x(t) < \infty\} \text{ and } \int_{J_x} \{\dot{x}(t)\}^{-\alpha/(1-\alpha)}\, dt \leq 1\Big\}.$$

We prove the following theorem.

Theorem. *With probability* 1 *as* $h \downarrow 0$, $D_\alpha(h)$ *is relatively compact with the set of limit points* K_α.

On the Ibragimov–Iosifescu Conjecture for ϕ-Mixing Sequences

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The aim of this paper is to give new central limit theorems and invariance principles for sequences of ϕ-mixing sequences of random variables that come to support the truth of the Ibragimov–Iosifescu conjecture. A related conjecture is formulated and a positive answer is given for the distributions that have tails regularly varying with the exponent -2.